



C. Dukes Scott
Executive Director

STATE OF SOUTH CAROLINA
OFFICE OF REGULATORY STAFF

1401 Main Street
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Columbia, SC 29201

October 14, 2015

Byron W. Hinson
Director Rates and Regulatory Services
SCANA Services, Inc.
220 Operation Way, MC C111
Cayce, SC 29033

Re: Construction of V.C. Summer Units 2 & 3

Dear Mr. Hinson,

On September 10, 2015, ORS consultant, Gary Jones, visited Greenberry and Vigor (previously Oregon Iron Works) module-fabrication facilities located near Portland, Oregon. Below are ORS observations and recommendations resulting from Mr. Jones' visit; SCE&G needs to:

- Ensure that the Consortium improves the continuity and performance of their source inspectors assigned to the subject facilities. Turnover of CB&I source inspectors at Greenberry, especially among the leadership, has been high. This turnover has contributed to the delays in module delivery due to re-inspections. Every change in leadership produces new directions and new inspectors restarting the process. In fact, the Westinghouse lead assigned to the area had never visited the Greenberry facilities or offices.
- Pursue changes with the Consortium source-inspection processes and procedures at these facilities and possibly at other module-fabrication facilities. The extent of the required documentation to be submitted as part of the module and sub-module Certificates and Conformance is excessive and unnecessary. CB&I inspectors could perform their inspections and checks earlier in the process, rather than waiting until all the paperwork has been completed by the fabricators. These issues have resulted in unnecessary delivery delays.

- Continue to pursue the release of design-change documentation to the fabricators. Changes have been held by CB&I and not released to the fabricators because of contract cost-dispute issues between Westinghouse and CB&I. At the time of their meeting, no changes had been released to Greenberry since late March of this year and none had been released to Vigor since early June. The withholding of design-change documentation represents hundreds of changes and has resulted in delays in delivery; it will also result in extensive rework at the site once the modules are received.

Subsequent to their meetings, Mr. Jones was advised by SCE&G that action has been taken on this issue and that the changes were being prioritized by CB&I and released to the fabricators for incorporation. However, this momentum needs to continue and detailed monitoring is required.

With regard to the 2015-09-22 and 2015-09-23 visit to the V.C. Summer site, ORS staff and Mr. Jones were advised that no schedule update was provided to SCE&G by the Consortium in August. The reason provided is that the schedule is being revised to reflect the current delays in the shield building panel deliveries from the fabricator (Newport News Industrial) and the delays in the erection of the shield building panels. These delays are above and beyond those outlined in the recent SCE&G filing under Docket No. 2015-103-E that were approved by the PSC as well as those that had been reported to the ORS in July. It was stated that the expected delay will be an additional four months. No indication yet exists that these dates will be beyond the 18-month window granted by the PSC; however, timely completion of the VCS Unit 3 required to receive the tax credits expiring at the end of December 2020 may be in jeopardy. The revised dates should be provided by or before the ORS' planned October visit to the site.

Sincerely,



C. Dukes Scott
Executive Director



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STATE OF SOUTH CAROLINA
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1401 Main Street
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Columbia, SC 29201

December 14, 2015

Byron W. Hinson, Director
Rates and Regulatory Services
SCANA Services, Inc.
220 Operation Way MC C111
Cayce, SC 29033

Dear Mr. Hinson,

This summary is based on the following information: (1) ORS review of construction documents provided by SCE&G during the month of November 2015 (2) ORS review of the Agreement dated 10-27-15 among SCE&G, Westinghouse, and CB&I that outlines the terms and conditions for the planned assumption of all responsibilities for the EPC Contract by Westinghouse "Agreement" (3) ORS tour of the construction site on 11-17-15 and (4) ORS review of information obtained from the regular monthly meeting with SCE&G NND management and the ORS held on 11-17-15 and 11-18-15.

Certain provisions of the Agreement should be revisited and revised to provide more favorable terms to SCE&G and to the rate payers. The following comments are directed toward the referenced corresponding paragraphs in the Agreement:

- Paragraph 2- Adequate detail is not provided in the Agreement to assess the efficacy of the option for the Fixed Price of \$6.082 B (100%) for the remaining work performed beyond 6-30-15. Additional information is needed.
- Paragraph 3- Currently, the justification provided to increase the Fixed Price Contract Price by \$300 M (100%) is insufficient. The back-up information provided in the reference Exhibits does not provide sufficient detail, and the relationship of this increased amount to that approved in the recent PSC order is not clear.
- Paragraph 4- It is not clear why the issues outlined in Exhibit C could not be resolved as part of the Agreement and what impact these issues may have on the total cost of the Project once they are resolved.
- Paragraph 8- The provision to defer the \$250 M (100%) /unit penalty if the Federal Tax Credit is extended removes a very strong incentive to complete the work on the current schedule.
- Paragraph 10- The bonus should be reduced if the Federal Tax Credit is extended and the Project is delayed beyond the current planned completion dates.

The other revised provisions contained in the Agreement are positive and important steps that should advance the Project and improve the performance, as well as provide more financial surety and reduce the schedule and cost risk to SCE&G. However, the current plan to utilize Fluor solely as a contracted construction manager with no direct responsibility for the craft labor causes concern.

With regard to the construction status of the Project:

1. The construction schedule for Unit 3 has not been adequately integrated considering proper sequencing of precursor activities. In addition, the required resources have not been adequately assessed, especially with regard to the impact of delays in the construction of Unit 2 and how this will impact the staffing of Unit 3. The current schedule utilizes overly optimistic assumptions with regard to acceleration of module deliveries and erection, construction productivity improvements on all commodities, and the acceleration of testing and start-up activities. SCE&G needs to reassess the Unit 3 schedule with the EPC Contractor.
2. Delayed structural module fabrication and delivery continue as a critical issue for the Project. Improvements are needed from all subcontractors and the continued role of CB&I - Lake Charles needs immediate attention and resolution.
3. The required mitigation approach to accelerate the Unit 2 and Unit 3 Shield Building panels from Newport News Industrial was not finalized, and it is not clear that the approach is still viable. SCE&G needs to determine whether mitigation is still an option and determine the impact on the Project.
4. Some confusion may exist about the selected fabricator for the air baffle and tension ring portion of the Shield Building. This issue is one of the most complicated areas on the entire Project and is currently on the critical path for project completion. SCE&G needs to resolve this responsibility and ensure the fabrication is expeditiously proceeding with a suitably qualified subcontractor.
5. The increased labor productivity rates necessary to attain the completion dates for the Project have not been realized, and no discernable progress has occurred. Some additional delays can be expected in the transition relating to CB&I's departure and Fluor coming up to speed; therefore, it is difficult to understand how these delays, coupled with the continued below-par productivity rates, support the Project completion dates. This issue will need to be addressed by SCE&G once the transition is completed.

Sincerely,



C. Dukes Scott
Executive Director



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1401 Main Street
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January 5, 2016

Byron Hinson, Director
Rates and Regulatory Services
SCANA Services, Inc.
220 Operation Way MC C111
Cayce, SC 29033

Re: VCS 2 & 3 Construction

Dear Byron,

The following comments are based on ORS' tour of the VCS 2 & 3 construction site on 12-15-15, meetings with SCANA/SCE&G management staff on 12-15-2015 and 12-16-15, tour of the recently activated CB&I VCS project Metro Warehouse near the Columbia Airport, and the review of project construction documents during the month of December 2015.

The ORS remains concerned that Westinghouse has not allowed Fluor to assume direct responsibility for the craft labor on the site. Fluor is functioning only as a contracted construction manager. Westinghouse is not a constructor and has no relevant experience in this area. If the productivity and efficiency gains required to complete this project in a timely manner and within budget are to be realized, Fluor will need to leverage its vast experience in this area through utilizing specific work processes and management controls, which it can do only if it is granted direct responsibility for the craft labor. Discussions should begin with SCANA/SCE&G toward effecting this change.

Inventory storage and control present one of the major challenges to successful completion of the project. CB&I intends to conduct a complete site inventory and re-verification of the site warehouses and lay-down areas. This effort will assist the project in properly staging equipment and commodities to support ongoing construction activities.

We believe SCE&G intends to take a more active role in ensuring that construction work packages are properly prepared and complete, which includes the proper staging of the required equipment and commodities. One of the most significant drains on project construction productivity has been the inability to maintain the craft focused on a work activity due to incomplete or inadequate work packages and material availability. Ensuring accurate and complete preparation of construction work packages should be a top priority that is continually monitored.

Please refer to the comments previously provided to you. Those comments remain valid and relevant.

Sincerely,



C. Dukes Scott
Executive Director



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STATE OF SOUTH CAROLINA
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1401 Main Street
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May 13, 2016

Mr. Kenneth R. Jackson
Senior Vice President
Economic Development, Government and Regulatory Affairs
SCANA Services, Inc.
220 Operation Way
Mail Code D309
Cayce, SC 29033-3701

Dear Mr. Jackson,

The following provides the ORS' comments and recommendations resulting from the site tour, meetings with senior site personnel, and document reviews performed at the VC Summer Units 2 & 3 construction site:

1. The ORS met with the lead Westinghouse Electric Company (WEC) project scheduling staff for the first time since Fluor became involved in the project. This meeting allowed the ORS to review the current revised integrated project schedule in more detail. The ORS now has a better understanding of the assumptions and bases of the schedule and the process of its development over the past few months. We learned that the initial schedule presented by WEC in August 2015 had arbitrarily held constraints that resulted in an unreliable and unrealistic depiction of the schedule for the remaining work. SCE&G and the on-site WECTEC project schedulers have worked to refine and accurately represent the remaining work and the logical ties among the work activities, as well as to reduce the number of arbitrary constraints. The ORS also obtained a better understanding of the documentation available to help us understand the schedule, including a more detailed Project Plan-of-the Day package. However, the ORS remains concerned that the schedule still needs refinement and has not yet received a complete detailed review and revision by Fluor that includes the resources needed to complete each task. This review will not be completed until the third quarter of this year. By that time, the ORS is concerned that additional delays may be identified in the project completion dates, especially on Unit 3.

The ORS also met with SCE&G staff who produced documents to support senior SCANA/SCE&G executives during negotiations with WEC that culminated in the October 2015

changes to the Engineering, Procurement, and Construction Contract Agreement (Amendment). This meeting provided additional insight into the financial basis of the final settlement and allowed ORS to gain a better understanding of the relationship between the project completion costs presented in the Amendment and those previously represented. However, costs shown in the Amendment are the result of a negotiation and do not represent a detailed accounting of the costs associated with each and every remaining project activity. Thus far, no rigorous and detailed comparative roll-up of the final costs is available. This presents a challenge as ORS evaluates and assesses the project costs presented in the Amendment.

2. With regard to construction progress on the project:

Positives

- a. SCE&G completed the concrete fill within the walls of the Unit 2 CA20 structural module on April 5. As the first concrete fill of a major structural module on the site, completion of this item is a significant accomplishment.
- b. All 17 submodules on Unit 2 CA03 are now standing upright on the plenum in the fabrication tent on site, and final welding and outfitting of the module are underway. The module is on schedule for its placement in the containment vessel in June.
- c. Newport News Industrial has made good strides in meeting their most recent schedules for delivery of Shield Building (SB) panels, and the erection of Course 4 of the SB panels has been completed at the construction site.
- d. Progress has been made on the on-site fabrication of the Unit 3 CA20 module, subassemblies 1 & 2, in the Module Assembly Building (MAB) that supports a July 2016 placement date. All 72 submodules for this module have been delivered to the site, and subassemblies 3 & 4 have already been placed in the Unit 3 Auxiliary Building.
- e. Progress was evident in the MAB on the Unit 3 CA01 module. Six submodules were erected on the plenum in a single week in April, which represents the highest production yet on this activity.
- f. Unit 3 Containment Vessel (CV) Ring # 1 installation was completed on April 13.

Concerns

g. SCE&G received notification on April 21 from WEC of a quality issue with Mangiarotti components already delivered to the site. The issue involves 11 of the 26 sub-suppliers of safety-related pressure boundary materials and may impact the accumulator tanks, core make-up tanks, pressurizers, Passive Reheat Removal heat exchangers, flued heads, and guard pipes. An action plan is due by May 31, and this issue may be a 10CFR Part 21 reportable infraction. This problem is significant because it may delay the installation of accumulator tanks. These tanks were due to be installed in the next couple of weeks and were to be the first major Nuclear Steam Supply System components installed in the plant.

h. The repairs to Turbine Building Bay 1 relating to an unacceptable concrete cold joint have been significantly delayed and are not progressing well. The hydro-lasing contractor is not meeting his promised productivity and may not be able to recover or improve. SCE&G is pursuing alternate paths to resolve this issue.

i. Progress on the Turbine Buildings continues to be significantly behind schedule (up to 6 months late in some cases), primarily due to craft labor shortages and diversion of labor to Nuclear Island work. SCE&G is working with Fluor and WECTEC to address this issue.

j. Continuing commodity shortages have resulted in delays. Fluor is to assume greater responsibilities in commodities purchasing and control, and SCE&G hopes to see improvements soon.

k. Construction labor productivity rates and overall productivity improvements have not yet significantly increased, although the activity levels have increased. Craft labor manpower increases will need to occur soon if there is to be a chance of meeting project completion dates. Process changes in several areas such as welding, procurement, and work-package preparation and closure will also soon need to be implemented to meet completion schedules.

l. Progress in completing the so-called "Reactor Containment" areas of the Unit 2 Auxiliary Building that support the SB panels has been problematic, primarily due to design changes and commodity shortages. This area is very near critical path and needs additional focus and effort.

m. Mechanical module delivery continues to fall behind schedule. As a result, SCE&G and WECTEC are considering moving fabrication to the site. While this may

Letter- Kenneth R. Jackson
May 13, 2016
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improve quality and better support construction, it will increase the demands on craft labor on site, and may increase project costs.

More activity and project progress were visible and apparent during this site visit; however, challenges remain and the full benefits of the transition to the new contracting arrangements are yet to be realized.

Sincerely,



C. Dukes Scott

Cc: Byron W. Hinson, Director



C. Dukes Scott
Executive Director

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1401 Main Street
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June 30, 2016

Byron W. Hinson, Director
Rates and Regulatory Services
SCANA Services, Inc.
220 Operation Way
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Cayce, SC 29033-3701

Dear Byron,

The ORS is currently in a heightened state of concern regarding the construction cost overruns and schedule delays for V.C. Summer (VCS) Nuclear Units 2 & 3 (the Units).

Westinghouse and Fluor continue to struggle with craft labor productivity. While a slight improvement was shown during the first three months of Fluor's tenure on site, the most recent two months have trended negatively, with a performance factor now hovering around 2.0. This score indicates that only about half the work planned is being done for the labor hours expended. Furthermore, the project has not attained the improved productivity factor of 1.15 that formed the basis for the approved schedule and budget in Order No. 2015-661. Fluor's efforts to implement process changes through their Functional Area Assessments and subsequent improvement recommendations appear to be a step in the right direction; however, the assessments and the associated implementation of identified improvements are moving much too slowly. This effort needs to accelerate dramatically if the project is to meet its scheduled completion dates.

Fluor's recruitment efforts to increase craft labor are not meeting the targets required to support construction, and the year-end goal of increasing on-site craft labor by 1,000 is in jeopardy. Fewer applicants than needed are applying, and rejection rates are higher than expected due to a number of factors including lack of qualifications, failed background checks, and no-shows. Candidates are also taking other jobs they consider more attractive. In addition, the attrition rate among existing craft employees is higher than expected. The higher rate is due to terminations for continued absenteeism, resignations for other employment, and other factors. This shortage of labor also places the substantial completion dates in jeopardy.

Although not yet reflected in the latest project progress reports, concern exists about the recent upturn in job-related injuries and incidents. In some instances, this trend appears to be the result of a declining safety culture attitude among the craft workers, along with uncertainty surrounding the new project management structure and the divisions of responsibility. Issues of this type have the very real possibility of resulting in a work stoppage and need to be immediately addressed and resolved.

The lack of availability of key commodities continues to plague the project and result in construction delays. Note that this issue is not tied to major components, as most of these are now on-site far ahead of their actual construction need date. The commodities in question are rebar, welding rod, standard structural steel, bolting, lubricants, steel plates, Nelson studs, and other standard construction commodities. These shortages are the result of Westinghouse's "just-in-time" approach to the ordering and delivery of these commodities. This approach has proved to be ineffective as the components are not available when required. On large construction projects, such commodities are routinely stocked in sufficient quantity to ensure they do not delay construction. Our consultant states that he has never worked on a nuclear project that was delayed by the lack of availability of standard rebar. At VCS, standard rebar unavailability has resulted in construction delays of critical path activities.

Other procurement issues, primarily associated with the negotiation of subcontracts and change orders, are becoming critical. Despite the fact that ten issues requiring change orders were identified in Exhibit C of the October 2015 Agreement, SCE&G and Westinghouse have been able to reach agreement on only a few of these issues in the intervening eight months. In addition, delays in the full authorization of several key subcontracts are putting the substantial completion dates of the project at risk.

Consistently meeting the construction schedule continues to be a significant issue for the project. This area must improve if any credibility is to be assigned to the current substantial completion dates and associated mitigation strategies that must be implemented in order to bring the plant to completion.

Module fabrication and delivery continue to drive the critical paths for the project; however, the focus is gradually shifting from structural modules to mechanical modules and structural steel modules in the Nuclear Island. In addition, the transition areas at the Shield Building to Auxiliary Building roof and the air inlet/tension ring areas of the upper Shield Building are becoming increasingly important. Contracts need to be finalized, and fabrication releases need to be expeditiously forthcoming in order to avoid schedule impacts. As it is, because these contracts have taken so long to be finalized, these items will be on a very tight schedule with little margin.

Concerns about the schedule also extend to the installation of components such as piping erection, cable raceway installation and cable pulling, instrumentation and tubing installation, HVAC equipment and ductwork installation, and wiring and termination. Historically, these areas have been the most difficult to complete when constructing nuclear power plants; however, very little of this effort has been completed on the Units. The modular construction methodology may

prove beneficial in this regard, but that remains to be seen. The tendency toward slow installation exhibited thus far is especially concerning in light of the project's inability to meet the construction schedule to date. Sustained installation rates will need to be demonstrated before the ORS has confidence in the project's ability to complete these areas in a timely manner.

Design changes continue to adversely affect fabrication and construction schedules. The number of design changes appears to be high considering the design completion status that the ORS understood in the early stages of the project. The factors driving these changes need to be further investigated, and additional management controls need to be established with the goal of reducing the frequency of design changes to only those that are absolutely required.

Operational readiness is also emerging as a concern. It is not clear at this point whether the required number of operations staff will be ready to perform the required testing and start-up support activities. The operational readiness schedule has not yet been incorporated into the integrated project schedule, so the true impact is not yet known. In addition, questions remain regarding the availability of the final Plant Reference Simulator in time to support operator training and procedure completion. Testing and operations procedure completion in time to support fuel load and commercial operation are also a concern.

In light of these concerns, ORS offers the following observations. SCE&G may benefit from evaluating a contract structure that provides the utility with more active involvement and control, rather than assigning all control to Westinghouse through the Option. The addition of Fluor as a subcontracted construction manager is a good step; however, Westinghouse still retains all control as the sole contractor. Consequently, Westinghouse controls the project budget, the majority of project procurement, and makes decisions about which methodology to use when problems arise. This is not an ideal arrangement. A better arrangement would include a contract that emphasizes partnership.

The process changes identified through Fluor's Functional Area Assessments need to be accelerated. If properly implemented, these changes should result in improved productivity by the workforce. In addition, the impact of these changes should be quickly assessed and any further improvements must be implemented expeditiously. The first priority should be the implementation of the so-called "Min/Max" approach to purchasing commodities so that construction delays are not caused by the lack of construction commodities which are readily purchased.

The design change process also needs further management review and control. Changes should be assessed as to absolute need and impact on construction, and changes not meeting these requirements should not be implemented. SCE&G should be a part of this assessment process.

SCE&G and Westinghouse also need to come to an agreement on the milestone payment schedule soon. All necessary management and executive focus required to accomplish this goal must be utilized.

Any approach to this project that totally excludes Westinghouse is unlikely to be successful for the project. Westinghouse has key design responsibilities for all safety-related and almost all other key systems and components. In addition, they are the primary designers for the physical plant itself, including the structural and mechanical modules. Westinghouse must be a part of the

project if there is to be any hope of successfully completing it. In some areas, a more experienced architect/engineer might provide needed assistance which could be pursued in conjunction with Westinghouse. However, no successful scenario exists that totally excludes Westinghouse's participation.

In the case of Unit 2, ORS believes that, while the date in the filing of August 31, 2019 is unlikely to be met, it is possible that Unit 2 may still be able to qualify for the Federal Production Tax Credits that expire on December 31, 2020. However, completing Unit 2 in time to receive the Federal Production Tax Credits will require improvements to the current construction methodology.

For Unit 3, ORS has a much lower confidence level that this Unit can be completed within the 18 month window. ORS has no confidence that Unit 3 can meet the current Federal Production Tax Credit deadline of December 31, 2020. This finding is based on the lack of performance in multiple areas cited in the preceding section of this letter. In addition, Fluor has not completed their schedule assessment and has not prepared a resource loaded integrated project schedule. This makes the validity of the current schedule highly suspect.

Sincerely,



C. Dukes Scott
Executive Director



FAX TRANSMITTAL SHEET

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Date: July 12, 2016

=
Please Deliver Immediately To: **Byron Hinson**

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Number of Pages (including this cover sheet): **7**

Fax is From:

☐ For Review

☐ Please Reply

☐ Urgent

Message / Comments:

Dear

The ORS is currently in a heightened state of concern regarding the construction cost overruns and schedule delays for V.C. Summer (VCS) Nuclear Units 2 & 3 (the Units). Our concerns are outlined below and include SCE&G's responses:

1. **ORS Concern:** Westinghouse and Fluor continue to struggle with craft labor productivity. While a slight improvement was shown during the first three months of Fluor's tenure on site, the most recent two months have trended negatively. Furthermore, the project has not attained the improved productivity factor of 1.15 that was anticipated in the approved schedule and budget in Order No. 2015-661. Fluor's efforts to implement process changes through their Functional Area Assessments and subsequent improvement recommendations appear to be a step in the right direction; however, the assessments and the associated implementation of identified improvements are moving much too slowly. This effort needs to accelerate dramatically if the project is to meet its scheduled completion dates.

SCE&G Response: SCE&G asserts that SCE&G and Santee Cooper have initiated an effort with Westinghouse and Fluor to align the four companies on the top five project focus areas; the productivity factor will be addressed in one of these five areas, which is construction efficiency and schedule adherence. Fluor has analyzed the Shaw and CB&I Power project controls system and determined that it is necessary to convert the project to Fluor's controls system. Once completed, a more meaningful productivity factor can be monitored and used to identify issues by discipline/area and to more accurately predict resource needs. SCE&G anticipates that initiatives in the other four top focus areas—prevention and timely resolution of design issues, modules, construction resources, and procurement—will also improve the site craft productivity factor.

2. **ORS Concern:** Fluor's recruitment efforts to increase craft labor are not meeting the targets required to support construction, and the year-end goal of increasing on-site craft labor by 1,000 is in jeopardy. Fewer applicants than needed are applying, and rejection rates are higher than expected due to a number of factors including lack of qualifications, failed background checks, and no-shows. Candidates are also taking other jobs they consider more attractive. This shortage of labor also places the substantial completion dates in jeopardy.

SCE&G Response: SCE&G replies that construction resources is a top five project focus area and that Fluor has provided metrics on recruiting and attrition to a much higher level of detail and greater depth than previously provided by CB&I. SCE&G further informs ORS that Westinghouse and Fluor are in the process of pursuing a number of mitigation strategies to increase the number of craft labor personnel including, among other things, evaluating craft compensation packages (mobilization, pay rate, per diem, retention incentive, etc.) against current markets for each discipline; subcontracting to augment direct hire craft; and relocating demobilized craft at other Fluor projects to V.C. Summer.

3. ORS Concern: Although not yet reflected in the latest project progress reports, concern exists about the recent upturn in job-related injuries and incidents. In some instances, this trend appears to be the result of a declining safety attitude among the craft workers, along with uncertainty surrounding the new project management structure and the divisions of responsibility. Issues of this type need to be immediately addressed and resolved.

SCE&G Response: SCE&G asserts that, even with the recent job-related injuries, the site OSHA statistics are below industry standard for a large industrial construction project and that safety metrics of TRIR and DAFW are improved over last year. SCE&G is continuing to provide a high level of industrial safety oversight and, in response to the recent injuries, Westinghouse and Fluor are working to improve the safety awareness at the site by, among other things, involving executive leadership in Health Safety and Environmental (HSE) meetings and audits; increasing HSE field presence; and increasing field observation from field non-manual personnel utilizing the Hazard Elimination Card Program.

4. ORS Concern: The lack of availability of key commodities continues to plague the project and result in construction delays. Note that this issue is not tied to major components, as most of these are now on-site far ahead of their actual construction need date. The commodities in question are rebar, welding rod, standard structural steel, bolting, lubricants, steel plates, Nelson studs, and other standard construction commodities. These shortages are the result of Westinghouse's "just-in-time" approach to the ordering and delivery of these commodities. This approach has proved to be ineffective as the components are not available when required. On large construction projects, such commodities are routinely stocked in sufficient quantity to ensure they do not delay construction. Our consultant states that he has never worked on a nuclear project that was delayed by the lack of availability of standard rebar. At VCS, standard rebar unavailability has resulted in construction delays of critical path activities.

SCE&G Response: SCE&G states that SCE&G, Santee Cooper, Westinghouse, and Fluor all agree that procurement is a top five focus area for the project. To address availability of key commodities, Westinghouse has recently consolidated the responsibility for delivery of material and equipment into a single organization so that each commodity now has a single point of accountability for scope, schedule, and budget. This organizational transition was completed at the end of June 2016.

5. ORS Concern: Other procurement issues, primarily associated with the negotiation of subcontracts and change orders, are becoming critical. SCE&G and Westinghouse have been able to reach agreement on only a few of the issues identified in Exhibit C of the October 2015 Amendment in the intervening eight months. In addition, delays in the full authorization of several key subcontracts are putting the substantial completion dates of the project at risk.

SCE&G Response: SCE&G replies that, as issues are identified during the project, evaluations are conducted and the parties first attempt collaborative resolution through technical reviews and discussions. The ten issues identified in Exhibit C of the October 2015 Amendment follow this

standard process. It was never anticipated that this process would be concluded and these issues would be resolved in eight months. As of June 2016, a change order is pending for two of the ten issues, and SCE&G does not anticipate that the remaining eight issues will have an impact on the project's substantial completion dates. It is possible, but not certain, that a change order will be required for some of the remaining eight issues. Regarding the overall change-order process, SCE&G sent a letter in June 2016 to Westinghouse reiterating previous concerns and requesting that they review their process so that the overall change-order process could be improved.

6. ORS Concern: Consistently meeting the construction schedule continues to be a significant issue for the project. This area must improve if any credibility is to be assigned to the current substantial completion dates and associated mitigation strategies that must be implemented in order to bring the plant to completion.

SCE&G Response: SCE&G asserts that construction efficiency and schedule adherence, including consistently meeting productivity factor, is a top five focus area for the project. SCE&G implemented a Project Management Organization (PMO) this year specifically to provide increased oversight of the project schedule by working with the Westinghouse PMO, which has resulted in the Westinghouse PMO adding key monitoring and reporting of the site milestones and covering schedule mitigation activities on a daily basis. Initiatives in other focus areas should improve the site's ability to meet the schedule.

7. ORS Concern: Module fabrication and delivery continue to drive the critical paths for the project; however, the focus is gradually shifting from structural modules to mechanical modules and structural steel modules in the Nuclear Island. In addition, the transition areas at the Shield Building to Auxiliary Building roof and the air inlet/tension ring areas of the upper Shield Building are becoming increasingly important. Contracts need to be finalized, and fabrication releases need to be expeditiously forthcoming in order to avoid schedule impacts. As it is, because these contracts have taken so long to be finalized, these items will be on a very tight schedule with little margin.

SCE&G Response: SCE&G asserts that modules, including fabrication and delivery, is a top five focus area for the project. In addition, SCE&G asserts that it maintains its on-site presence at key module vendors, has recently increased oversight efforts, and is working daily with Westinghouse personnel to align priorities, reporting, and mitigations. According to SCE&G, Westinghouse has given suppliers advance authorization to fabricate the Shield Building roof steel and Air Inlet/Tension Ring panels. Westinghouse is also reporting weekly to SCE&G on contract finalization for upcoming scopes of work and has increased authority levels for more than 30 engineers to resolve issues to improve supplier response times. Finally, Westinghouse has moved the responsibility for structural steel procurement from the commodity delivery organization to the module organization to aid this procurement.

8. ORS Concern: Concerns about the schedule also extend to the installation of components such as piping erection, cable raceway installation and cable pulling, instrumentation and tubing installation, HVAC equipment and ductwork installation, and wiring and termination. Historically, these areas have been the most difficult to complete when constructing nuclear power plants; however, very little of this effort has been completed on the Units. The modular construction methodology may prove beneficial in this regard, but that remains to be seen. The tendency toward slow installation exhibited thus far is especially concerning in light of the project's inability to meet the construction schedule to date. Sustained installation rates will need to be demonstrated before the ORS has confidence in the project's ability to complete these areas in a timely manner.

SCE&G Response: SCE&G replies that it is currently performing an assessment of installation of components on the CA03 module to identify efficiency gaps and will communicate improvement opportunities to Westinghouse and Fluor.

9. ORS Concern: Design changes continue to adversely affect fabrication and construction schedules. The number of design changes appears to be high considering the design completion status that the ORS understood in the early stages of the project. The factors driving these changes need to be further investigated, and additional management controls need to be established with the goal of reducing the frequency of design changes to only those that are absolutely required.

SCE&G Response: SCE&G states that prevention and timely resolution of design issues is a top five focus area for the project. Westinghouse and Fluor are undertaking advanced planning initiatives to maximize early identification and resolution of potential issues; increasing accountability to build as designed where practical and ensure alignment between construction and engineering; and focusing engineering resources on critical areas. The use of field engineering resources and "clash" software by Westinghouse and Fluor is beginning to pay dividends. A recent example is a set of four work packages where 111 issues were identified and corrected prior to work commencing, and only four issues were identified after work commenced. In addition, SCE&G is working with Southern Nuclear and the NRC to add a new license condition to allow construction work to proceed at risk where a License Amendment Request (LAR) is needed.

10. ORS Concern: Operational readiness is also emerging as a concern. It is not clear at this point whether the required number of operations staff will be ready to perform the required testing and start-up support activities. The operational readiness schedule has not yet been incorporated into the integrated project schedule, so the true impact is not yet known. In addition, questions remain regarding the availability of the final Plant Reference Simulator in time to support operator training and procedure completion. Testing and operations procedure completion in time to support fuel load and commercial operation is also a concern.

SCE&G Response: SCE&G replies that an Integrated Operational Readiness Schedule (IORS) has been well developed and contains over 32,000 operational activities in support of the plant. The Integrated Project Schedule (IPS) is imported from Westinghouse monthly or as necessary into the IORS. This process ensures consistency and alignment with the construction and Initial Test Program (ITP). In addition, a milestone management process with metrics has been established to monitor the readiness of the operating organization's ability to support the Units. Oversight of these activities is provided in a monthly management meeting that discusses milestones and metrics necessary for the transition from construction through plant startup and into plant operations. Ongoing initiatives are in place that continually refine the IORS and IPS schedules.

In addition, SCE&G asserts that training schedules have been developed to support training and qualification of operators needed for systems testing and turnover. Gap training is anticipated based on design differences between the simulator and the actual plant at time of start-up support activities; training needs associated with the design differences are manageable in the operator continuing training programs. SCE&G further asserts that operations procedure development will utilize Westinghouse simulation facilities to validate newly developed operational procedures. Station simulation facilities will be utilized to support initial licensed operator training and continuing training for operations instructors and licensed operators. Gap training needs will be determined and implemented through operator continuing training. The NRC Commission Approved Simulator (CAS), recently approved for Vogtle, will fully support initial and continuing training needs until the NRC makes the required findings under 10 CFR 103(g). Discussions are ongoing between VCS and NRC regarding the regulatory path to a Plant Reference Simulator.

In light of these concerns, ORS offers the following observations:

ORS Observations: The addition of Fluor as a subcontracted construction manager is a good step; however, Westinghouse still retains all control as the sole contractor. Consequently, Westinghouse controls the project budget, the majority of the project procurement, and makes decisions about which methodology to use when problems arise.

- A. ORS Recommendation: The process changes identified through Fluor's Functional Area Assessments need to be accelerated. If properly implemented, these changes should result in improved productivity by the workforce. In addition, the impact of these changes should be quickly assessed and any further improvements must be implemented expeditiously. The first priority should be the implementation of the "Min/Max" approach to purchasing commodities so that construction delays are not caused by the lack of construction commodities which are readily purchased.

SCE&G Response: SCE&G has scheduled a review of the Functional Area Assessment reports and actions with ORS on July 27, 2016.

- B. ORS Recommendation: The design change process also needs further management review and control. Changes should be assessed as to absolute need and impact on construction, and changes not meeting these requirements should not be implemented. SCE&G should be a part of this assessment process.

SCE&G Response: SCE&G has informed ORS that it has discussed these issues with Westinghouse on a regular basis.

- C. ORS Recommendation: SCE&G and Westinghouse also need to come to an agreement on the milestone payment schedule soon. All necessary management and executive focus required to accomplish this goal must be utilized.

SCE&G Response: SCE&G has informed ORS that it is continuing discussions with Westinghouse, but that if an agreement is not reached, SCE&G can file a claim with the Dispute Resolution Board (DRB), a mechanism created in the October 2015 Amendment to resolve matters such as this one without affecting the progress of the project. Issues presented to the DRB are to be resolved within 60 days.

- D. ORS Observation: Any approach to this project that totally excludes Westinghouse is unlikely to be successful for the project. Westinghouse has key design responsibilities for all safety-related and almost all other key systems and components. In addition, they are the primary designers for the physical plant itself, including the structural and mechanical modules. Westinghouse must be a part of the project if there is to be any hope of successfully completing it. In some areas, a more experienced architect/engineer might provide needed assistance which could be pursued in conjunction with Westinghouse. However, no successful scenario exists that totally excludes Westinghouse's participation.

SCE&G Response: SCE&G has informed ORS that it recognizes the need to keep Westinghouse fully engaged in the project. In the October 2015 Amendment, SCE&G negotiated new terms that SCE&G believes provides for the active involvement and attention of Westinghouse throughout the project.

ORS Observations: In the case of Unit 2, ORS believes that, while the date in the filing of August 31, 2019 is unlikely to be met, it is possible that Unit 2 may still be able to qualify for the Federal Production Tax Credits (FPTC) that expire on December 31, 2020. However, completing Unit 2 in time to receive the FPTC will require improvements to the current construction methodology.

For Unit 3, based on ORS' observations to date, the ORS has a much lower confidence level that this Unit can be completed to meet the current FPTC deadline of December 31, 2020. In addition, Fluor has not completed its schedule assessment and has not prepared a resource loaded integrated project schedule. Only after Fluor completes the assessment will the ability, or lack thereof, to achieve the FPTC deadline become clearer.

Sincerely,

C. Dukes Scott



C. Dukes Scott
Executive Director

STATE OF SOUTH CAROLINA
OFFICE OF REGULATORY STAFF

1401 Main Street
Suite 850
Columbia, SC 29201

August 8, 2016

Byron W. Hinson, Director
Rates and Regulatory Services
SCANA Services, Inc.
220 Operation Way, MC C111
Cayce, SC 29033-3701

Dear Byron,

The ORS is still in a heightened state of concern regarding the construction cost overruns and schedule delays for V.C. Summer (VCS) Nuclear Units 2 & 3 (the Units). ORS's most recent analysis, based on the monthly site visit and document review, is outlined below:

1. Construction progress was significantly more visible during this visit than last month. The Unit 2 CA03 module has been set inside of containment. This involved a complicated lift with the Heavy Lift Derrick (HLD) and very precise module placement. The overall setting of the module appears to have been well executed and the lessons learned from both China and Vogtle appear to have been incorporated appropriately. It was disappointing, however, that the scheduled date for this module set slipped several times. This leaves the CA02 module as the remaining major structural module to be installed in Unit 2. In addition, visible progress was seen in the Unit 2 Annex Building and the Unit 2 Turbine Building. The installation of structural steel in the top section of the Turbine Building also has progressed well.
2. Very informative briefings were provided by Carl Churchman (Westinghouse Vice President and Project Director) and Jeff Hawkins (Fluor Vice President and Site Project Director). They provided their perspective on the project status and the process improvements underway with respect to site industrial safety, the nuclear safety culture among the workforce, procurement, the project schedule, labor productivity and staffing, module fabrication and installation, field engineering and other aspects of the construction of the plant. Each voiced their deep commitment to completing the project

and recognized several key challenges that must be overcome to meet the project schedule.

3. An additional special briefing was held with Dan Magnarelli (Westinghouse), who heads up the Functional Area Assessments, and Rob Carlon and Mike Valore (Fluor) who are also working in this area. The status of these assessments and the implementation of the recommendations from at least some of these assessments are more advanced than we had previously understood. This briefing concentrated on the assessment of the procurement process and we learned the minimum/maximum methodology for the purchase of construction commodities is being implemented in several areas. This has the potential to result in decreased construction delays due to material unavailability. An extensive inventory of on-site commodities, along with an assessment of their construction readiness, is also underway. ORS plans to discuss the results of the remaining Functional Area Assessments, which cover a variety of fields including quality control, welding/NDE, field engineering and subcontracting, at future meetings.
4. ORS also had the opportunity to meet with senior SCE&G staff to discuss observations made during this visit. At the end of the visit, ORS met with Ron Jones, Byron Hinson and Jeff Archie. ORS provided an assessment of our concerns, especially with regard to schedule performance and the bases for cost increases and change orders being discussed as part of Docket No. 2016-223-E. ORS also discussed observations related to quality programs.
5. Craft labor productivity still continues to be an issue on the project. The target direct craft labor performance factors are still not being met and overall productivity is still falling significantly short of the goals set by Westinghouse and Fluor earlier this year. The previous monthly production goal for June was for approximately 1.25% of the work remaining to be completed during the month while the actual value achieved was 0.6%. The project construction was scheduled to be at about 25% complete by the end of June while it was actually at about 22% complete. This remains a serious issue that requires continued focus.
6. Related to the issue of production, craft staffing levels continue to be problematic. Fluor was scheduled to have added about 1,000 craft laborers to the project as of the end of June, but the net increase taking into account attrition has only been about 700. Attrition of the existing staff and the inability to attract qualified craftsmen, especially welders, is continuing to hamper the effort to increase the workforce. Fluor briefed ORS on some of their proposed strategies to mitigate these issues; however, until more progress towards meeting staffing goals occurs, this remains an area of concern.

7. The project faces several significant milestones over the course of the next month. Westinghouse and Fluor's performance with respect to completing these milestones effectively and on schedule will be a key indicator of performance trends. These challenges include the placement of concrete in Unit 2 RC01 and RC02 (reinforced concrete portions of the Shield Building), setting the Unit 2 CA02 module, the concrete placement of Layer 6 East in Unit 2 containment and the setting of the remainder of the Unit 3 CA20 module (subassemblies 1&2). If these activities all occur at or near schedule, it would be a significant indicator that the project has turned the corner on productivity and schedule adherence.
8. It was concerning to learn that the fabrication of the sub-modules for the Unit 3 CA03 module will remain with CB&I-Lake Charles. Although the logic (material availability, primarily) for this decision appears to be sound, the past performance of CB&I-LC with respect to producing modules on schedule and with the appropriate paperwork is concerning.
9. The project performance in all areas other than civil-structural still has not been demonstrated and remains a concern. Unit 2 is quickly approaching a point at which all major structural modules will be installed. As such, the focus of the work will begin to incorporate other disciplines more heavily. These areas include piping erection, cable raceway installation and cable pulling, instrumentation and tubing installation, HVAC equipment and ductwork installation and wiring. Historically, these areas have been some of the most difficult to complete when constructing nuclear power plants. Sustained performance in these areas going forward is critical for project success.
10. As the project progresses, an increasing number of Licensing Amendment Requests (LARs) will need to be processed each month to support construction. The number of LARs to be processed each month must double from 4 or 5 per month to 8 to 10 per month over the next several months in order to support construction activities. This presents another major challenge for the project.

As to the update filing:

1. The justifications and bases for a number of the change orders identified by SCE&G in Docket No. 2016-223-E remain inadequate, and in at least one case ORS's concerns have increased. Subsequent documentation submitted to justify the cost of the third floor addition to the Service Building indicates that SCE&G's current plan is to descope the entire Service Building from the EPC contract and assume this responsibility on their own. This not only causes concerns regarding the validity of the third floor addition

estimate, but now means that the entire cost of the Service Building would be transferred out of the scope of the EPC contract to the Owner. This would involve detailed coordination and negotiation with Westinghouse regarding site access, as well as the timing of construction activities and other commercial issues. The full impact of these changes on the budget for the Service Building is not yet known.

2. Agreement between Westinghouse and SCE&G has still not been reached on the revised milestone payment schedule. However, ORS was informed that the July transition payment of \$100 million will be the last such payment and if agreement was not reached by August 1, the issue would be referred to the Dispute Resolution Board.
3. ORS remains concerned about the overall construction schedule and continues its review of other cost estimates contained in Docket No. 2016-223-E.

Sincerely,

C. Dukes Scott
Executive Director

C: Kenny
Kevin B. Marsh
Chairman, President & CEO



January 18, 2017

Mr. Dukes Scott
Executive Director
Office of Regulatory Staff
1401 Main Street, Suite 850
Columbia, SC 29201

Dear Dukes,

Thanks for your letter dated December 29, 2016 regarding the recent announcement by Toshiba and Westinghouse of pending write-downs associated with the Summer and Vogtle AP1000 nuclear projects. I share your concerns regarding the impact of these write-downs and the delivery of the revised fully integrated construction schedule (the "revised schedule"). As we discussed, our SCANA team along with representatives of Santee Cooper met with Westinghouse and Toshiba in an effort to learn more about this situation and inquire about the delivery of the revised schedule we were expecting by the end of 2016. I also share your high level of interest in receiving the revised schedule as soon as possible.

I provided Westinghouse and Toshiba a copy of your letter to emphasize the importance of having access to the schedule as part of our commitment to keeping both the Office of Regulatory Staff and the Public Service Commission of SC updated on the status of the new nuclear project. Westinghouse and Toshiba have informed me that the revised schedule is a part of the financial review and evaluation of the pending write-downs associated with the AP1000 projects, and that they expect the revised schedule to be available at the time Toshiba releases its financial results in mid-February.

We continue to communicate with Westinghouse and Toshiba in order to monitor this situation as closely as possible and will update you accordingly.

Sincerely,

Kevin B. Marsh

KBM/pcr